REMARKS

Claims 1-2, and 4-20 were pending. Claims 1-2, and 4-19 stand rejected. Claim 20 is allowed. Claims 1-2, 4, 8, and 14-17 were amended. Claims 21-22 were added.

Specification

The disclosure was objected to because of the informalities and has been amended as suggested by the Examiner.

Claims

Claim 8 stands rejected under 35 U.S.C. 112, second paragraph. The rejection stated:

> 'Referring to claim 8, the metes and bounds of the term "elsewhere" are not clearly defined.'

Claim 8 has been amended to replace "elsewhere".

Claims 1 and 16 stand rejected under 35 U.S.C. 102(b) as being anticipated by the paper, "Indoor Scene Reconstruction front Sets of Noise Range Images", R.T. Whitaker, J. Gregor, P.F. Chen., University of Tennessee, IEEE's Second International Conference on 3-D Imaging and Modeling, 1999, (hereinafter 'renowned institution'). Claims 2, 4, 5, 7, 8 and 14-18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of 'the "renowned institution" and Hsieh et al. (USPN 6,011.558). Claim 6 stands rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of 'renowned institution' and Hsieh, and further in view of Ray (USPN 6,023,588). Claims 9 and 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of 'reowned institution' and Hsieh as applied to claim 4 above, and further in view of Lipscomb et al. (USPN 5,796,386). Claims 10-11 stand rejected under 35 U.S.C. 103(a) as being obvious over the combination of 'renowned institution' and Hsieh as applied to claim 4 above and further in view of Ray et al. (U.S. Patent No. 6,118,946 B1). Claims 12 and 13 stand rejected under 35 USC 103(a) as being obvious over the combination as applied to claim 10 above, and further in view of Ray (USPN 6,456,793).

Claim 1 was amended to state:

> 1. A method for deriving a three-dimensional panorama from a plurality of images of a scene generated by a range

imaging camera of the type that produces ambiguities in range

information, said method comprising the steps of:

acquiring a plurality of adjacent images of the scene,

wherein there is an overlap region between the adjacent images and at

least some of the adjacent images are range images;

estimating a relative range difference between adjacent

range images to provide an estimated constant offset between the

adjacent images;

optimizing said estimated constant offset to provide an

optimized constant offset; and

deriving a three-dimensional panorama from said

range images and said optimized constant offset.

Claim 1 is supported by the application as filed, notably at page 15, line 8 to

page 16, line 14.

Claim 1 requires estimating a relative range difference

between adjacent range images to provide an estimated constant offset

between the adjacent images and optimizing the estimated constant offset to

provide an optimized constant offset. The 3-D panorama is derived from the

range images and the optimized constant offset. This contrasts with

'renowned institution', which states:

"Presently, we determine the 25 data segments with the best planar fit

(from the set of the 50 largest ones) from each range map and present

those to a user, as shown in Figure 4. The user then establishes the

correspondences between pairs of images by selecting regions with a

cursor." ('renowned institution', page 4, first column, first full paragraph)

The 'renowned institution' reference then uses a plane fitting algorithm.

('renowned institution', page 3, right column, partial paragraph at top and

following paragraph) Resulting pairs of plane surface normals and offsets are

used to compute a translation vector. ('renowned institution', section 3.1)

Claims 2 and 21 are allowable as depending from Claim 1. Claim

21 is also allowable on the same basis as Claim 20.

Claim 4 states:

4. A method for deriving a three-dimensional

panorama from a plurality of images of a scene generated from a

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range imaging camera of the type that produces ambiguities in range information, said method comprising the steps of:

   (a) acquiring a plurality of images of the scene by rotating the camera about a Y-axis (vertical axis), wherein there is an inter-overlap region between adjacent images;

   (b) automatically providing offset data for each image to recover corrected relative scene spatial information (X,Y,Z) with respect to a local XYZ coordinate system;

   (c) selecting a reference three-dimensional world coordinate system against which spatial information of the scene can be correctly presented;

   (d) transforming the corrected relative scene spatial information (X,Y,Z) from each of the local three-dimensional coordinate systems of each of the images to the selected reference three-dimensional world coordinate system, thereby providing transformed (X,Y,Z) images;

   (e) warping the transformed (X,Y,Z) images onto a cylindrical surface, and forming a plurality of warped (X,Y,Z) images;

   (f) registering adjacent warped (X,Y,Z) images; and

   (g) forming a three-dimensional (X,Y,Z) panorama using the warped (X,Y,Z) images.

Claim 4 is supported by the application as filed, notably at page 11, lines 19-28.

   Claim 4 requires automatically providing offset data for each image to recover corrected relative scene spatial information (X,Y,Z) with respect to a local XYZ coordinate system. This contrasts with 'renowned institution', which states:

   "Also, our ultimate goal is a totally automated system, and to this end we have designed the system to rely on user input only for the scan-to-scan plane correspondences, which we hope to automate in future implementations." ('renowned institution', page 4, first column, partial paragraph at top; emphasis added)

The other cited references, in any combination with 'renowned institution' do not remedy this reliance on user input.

   Claims 5-13 are allowable as depending from Claim 14.

Claims 14-15 are supported and allowable on the same basis as Claim 1.

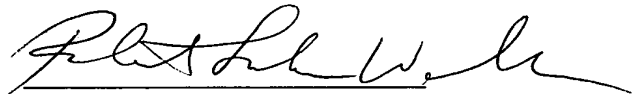Claims 16-17 are supported and allowable on the same basis as Claim 4.

Claims 18-19 are allowable as depending from Claim 17.

Claim 22 is supported and allowable on the grounds discussed above in relation to Claims 1 and 4.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,

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